The effect of gamma –secretase inhibition on the survival of dental pulp stem cells in vitro

Abstract

Introduction: Dental pulp derived stem cells (DPSCs) are immature and progenitor cells that can renewal themselves or differentiate into various types of cells. These two features make these cells an interesting candidate in Regenerative medicine. Notch signaling pathway plays an important role in self-renewal, proliferation and differentiation of stem cells. In This study, we examine the effect of gamma –secretase inhibition on the survival of dental pulp stem cells in vitro.

Methods and materials: Healthy Teeth have been used in this study. DPSCs were isolated by enzymatic digestion. An appropriate number of cells were treated with different concentrations of DAPT (1, 3, 6.25, 12.5, 25.5, 37.5, 50 and 100 µM). The metabolic activity of cells and the distribution of cells in different phages of cell cycle was evaluated by MTT assay and flow cytometry, respectively.

Results: The results of the experiments show that in low concentration of DAPT (1,3, 6.26,…) the growth rate of the cells increases, whereas in high concentration (25.5, 37.5, ..) the DAPT can significantly reduce the viability of the treated cells. The results also indicate that DAPT can interrupt the cell cycle in G1 phase.

Conclusions: The results of our studies showed that the DAPT for dose-dependent survival rate of dental pulp stem cells and affect cell population increase in the G1 phase of the cell cycle.

Keyword: Dental pulp stem cells, Notch signaling pathway, DAPT